

**CITY OF ASHTON (PWS 7220004)  
SOURCE WATER ASSESSMENT REPORT**

---

**April 27, 2001**



**State of Idaho  
Department of Environmental Quality**

**Disclaimer:** This publication has been developed as part of an informational service for the source water assessments of public water systems in Idaho and is based on data available at the time and the professional judgement of the staff. Although reasonable efforts have been made to present accurate information, no guarantees, including expressed or implied warranties of any kind, are made with respect to this publication by the State of Idaho or any of its agencies, employees, or agents, who also assume no legal responsibility for the accuracy of presentations, comments, or other information in this publication. The assessment is subject to modification if new data is produced.

## Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the Act. This assessment is based on a land use inventory of the designated assessment area and sensitivity factors associated with the wells and aquifer characteristics.

This report, *Source Water Assessment for City of Ashton, Idaho*, describes the public drinking water system, the boundaries of the zones of water contribution, and the associated potential contaminant sources located within these boundaries. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. **The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system.**

The City of Ashton drinking water system consists of two well sources, of which, Well #1 is the primary well and Well #2 is the backup well. The wells have high susceptibility to inorganic, volatile organic, synthetic organic, and microbial contamination due to: a moderate rating in hydrologic sensitivity, a high rating for system construction, and numerous potential contaminant sources. In addition wells have consistently approached or exceeded the Maximum Contaminant Level for nitrate (10 mg/L) in the summer months of the last few years. Current water chemistry tests have recorded no other significant problems with the well water.

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a “pristine” area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

For the City of Ashton, source water protection activities should focus on implementation of practices aimed at reducing the leaching of agricultural chemicals from agricultural land within the designated source water areas. The proposed practices outlined in the *City of Ashton Water Supply System Nitrate Mitigation Study* (Jorgensen Engineering, 2000) should be evaluated for implementation. Regulatory discrepancies outlined in the 1994 Sanitary Survey should be addressed if they have not already been corrected. Much of the designated protection areas are outside the direct jurisdiction of the City of Ashton. Partnerships with state and local agencies, and industry groups should be established and are critical to the success of source water protection. All wells should maintain sanitary survey standards regarding wellhead protection. Also, disinfection practices should be implemented if microbial contamination becomes a problem. A reverse osmosis system could be added to reduce the levels of nitrates delivered to customers. Additional management strategies for dealing with nitrate contamination are summarized in *Nitrates in Ground Water: A Continuing Issue for Idaho Citizens* (DEQ, 2001).

Due to the time involved with the movement of groundwater, source water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. Source water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission, the local Soil and Water Conservation District, and the Natural Resources Conservation Service.

A community with a fully developed source water protection program will incorporate many strategies. For assistance in developing protection strategies please contact the Idaho Falls Regional Office of the Idaho Department of Environmental Quality or the Idaho Rural Water Association.

# SOURCE WATER ASSESSMENT FOR CITY OF ASHTON, IDAHO

## Section 1. Introduction - Basis for Assessment

The following sections contain information necessary to understand how and why this assessment was conducted. **It is important to review this information to understand what the ranking of this source means.** A map showing the delineated source water assessment area and the inventory of significant potential sources of contamination identified within that area are attached. The list of significant potential contaminant source categories and their rankings used to develop the assessment also is attached.

### Background

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency (EPA) to assess every source of public drinking water for its relative susceptibility to contaminants regulated by the Safe Drinking Water Act. This assessment is based on a land use inventory of the delineated assessment area and sensitivity factors associated with the wells and aquifer characteristics.

### Level of Accuracy and Purpose of the Assessment

Since there are over 2,900 public water sources in Idaho, there is limited time and resources to accomplish the assessments. All assessments must be completed by May of 2003. An in-depth, site-specific investigation of each significant potential source of contamination is not possible. **Therefore, this assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system.**

The ultimate goal of the assessment is to provide data to local communities to develop a protection strategy for their drinking water supply system. The Idaho Department of Environmental Quality (DEQ) recognizes that pollution prevention activities generally require less time and money to implement than treatment of a public water supply system once it has been contaminated. DEQ encourages communities to balance resource protection with economic growth and development. The decision as to the amount and types of information necessary to develop a source water protection program should be determined by the local community based on its own needs and limitations. Wellhead or source water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

## Section 2. Conducting the Assessment

### General Description of the Source Water Quality

The public drinking water system for the City of Ashton is comprised of two ground water wells that serve approximately 1,200 people and 525 connections. The wells are located in Fremont County, within 110 feet of each other, on the eastern side of the City of Ashton (Figure 1).

The significant water chemistry problem that has been recorded in the finished well water is the inorganic contaminant (IOC) nitrate. Both wells have consistently approached or exceeded the Maximum Contaminant Level (MCL) of 10 mg/L in the summer months. The Drinking Water Information Management System (DWIMS) records the monthly nitrate sampling data for the period from June 1997 to February 2001 (Figure 2). A complete source of information on the nitrate problem in Idaho is available (DEQ, 2001) and DEQ is currently working on a nitrate report specific to the Ashton area. As nitrate is the primary concern in the area, a short description of the health affects of nitrate and the possible sources of nitrate are summarized here (DEQ, 2001).

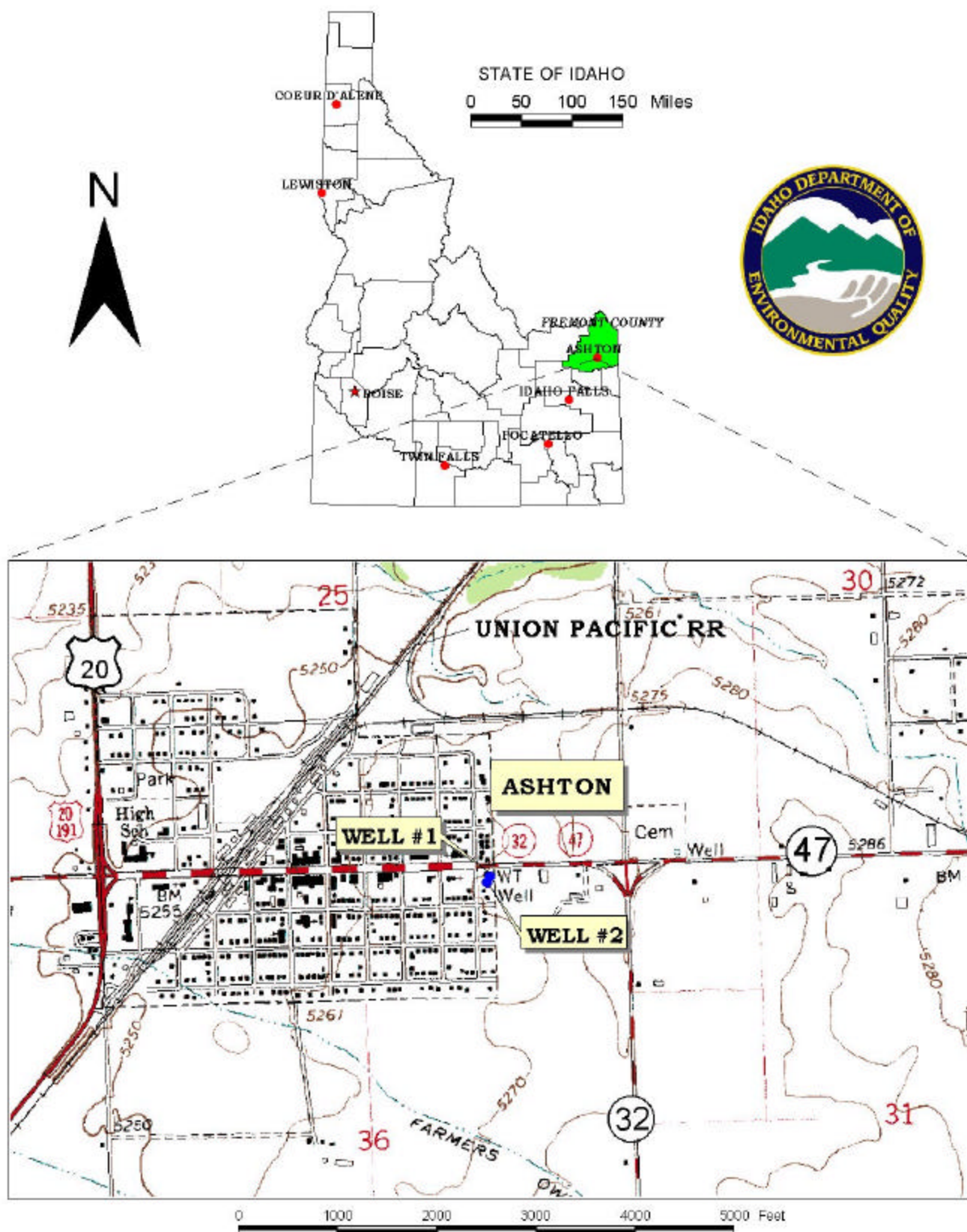
Exposure to nitrate in concentrations over the 10 mg/l MCL has been associated with a condition called methemoglobinemia or "blue-baby syndrome" in infants six months of age and younger (EPA, 1990a). Nitrate in drinking water used to make baby formula is converted to nitrite in the baby's stomach. Nitrite changes hemoglobin (that part of the blood that carries oxygen to the cells) to methemoglobin which is unable to bind with oxygen, thus depriving the cells of oxygen. In extreme cases it can cause death.

Several investigators nationally have studied the chronic health and reproductive impacts of drinking nitrate contaminated water. Recent studies have implicated nitrate exposure as a possible risk factor associated with non-Hodgkin's lymphoma, gastric cancer, hypertension, thyroid disorder and birth defects (Gilli, et. al., 1984, Scragg, 1982, Rademacher, 1992). A recent investigation conducted by local public health officials in La Grange County, Indiana implicated nitrate-contaminated drinking water as the possible cause of several miscarriages (Schubert et. al., 1997).

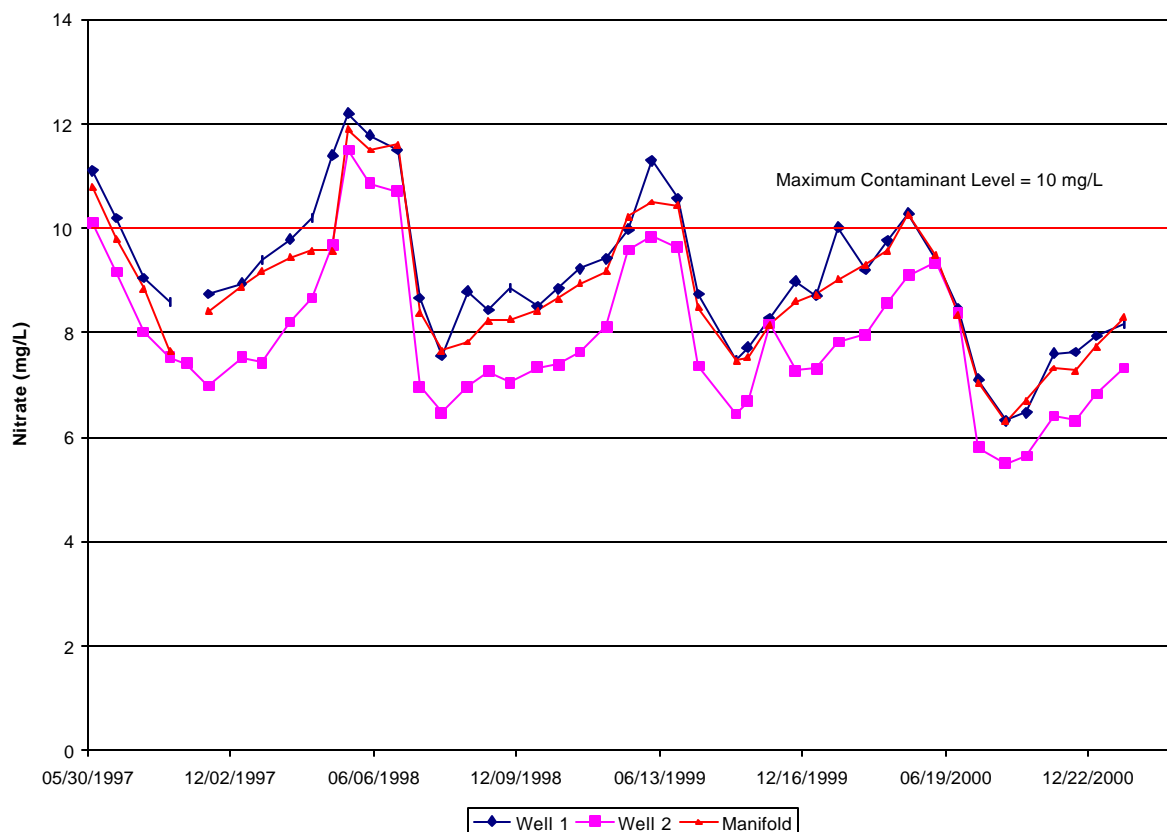
Estimates of nitrogen input to soil in Idaho show that fertilizer contributes the greatest amount of total nitrogen, followed by cattle and dairy manure, legume crops, precipitation, and domestic septic systems. Approximately 93% of the nitrogen input originates from agricultural sources-- legumes, manure and commercial fertilizer. Another 5% of the nitrogen comes from atmospheric sources including combustion of gasoline in automobiles and lightning. The remaining 2% comes from septage, sludge disposal, and other sources.

Total coliform bacteria and *E-coli* bacteria have been detected in the distribution system, but repeat samples have never found bacteria present at the wellheads. No volatile organic contaminants (VOCs) or synthetic organic contaminants (SOCs) have been detected in the well water.

**FIGURE 1. Geographic Location of the City of Ashton**



**Figure 2. Nitrite levels for June 1997 through February 2001**



## Defining the Zones of Contribution – Delineation

The delineation process establishes the physical area around a well that will become the focal point of the assessment. The process includes mapping the boundaries of the zone of contribution into time-of-travel (TOT) zones (zones indicating the number of years necessary for a particle of water to reach a well) for water in the aquifer. DEQ used a refined computer model approved by the EPA in determining the 3-year (Zone 1B), 6-year (Zone 2), and 10-year (Zone 3) TOT for water associated with the Teton Basin aquifer in the vicinity of the City of Ashton. The computer model used site specific data, assimilated by DEQ from a variety of sources including the City of Ashton's well logs, other local area well logs, and hydrogeologic reports (Crosthwaite et al., 1970; Jorgensen Engineering, 2000; Whitehead, 1978; Whitehead, 1992). The delineated source water assessment areas for the City of Ashton wells can best be described as a corridor approximately 3 miles long and 1 mile wide extending to the east of the City of Ashton (Figure 3). The actual data used by DEQ in determining the source water assessment delineation areas are available upon request.

Wells #1 and #2, in the City of Ashton system, draw their water from the silicic volcanic rocks of the Yellowstone Group and the basalt of the Snake River Group. The basalt aquifer has adequate water for domestic wells because it has sufficient fracture zones that produce water. Larger yields are limited to places where the basalt flows are highly permeable. Specific capacities of some tested wells completed in the basalt have transmissivities ranging between 1,400 to 8,600 ft<sup>2</sup>/day (Jorgensen Engineering, 2000). The direction of groundwater flow in the Ashton area is generally from east to west. Locally, water flows in the direction of the Henrys Fork above the Ashton aquifer.

## **Identifying Potential Sources of Contamination**

A potential source of contamination is defined as any facility or activity that stores, uses, or produces, as a product or by-product, the contaminants regulated under the Safe Drinking Water Act and has a sufficient likelihood of releasing such contaminants at levels that could pose a concern relative to drinking water sources.

The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of groundwater contamination. The locations of potential sources of contamination within the delineation areas were obtained by field surveys conducted by DEQ and from available databases.

The dominant land use outside the City of Ashton area is irrigated agriculture. Land use within the immediate area of the wellheads consists of residential subdivisions, urban uses, and agricultural uses.

It is important to understand that a release may never occur from a potential source of contamination provided they are using best management practices. Many potential sources of contamination are regulated at the federal level, state level, or both to reduce the risk of release. Therefore, when a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that this business, facility, or property is in violation of any local, state, or federal environmental law or regulation. What it does mean is that the potential for contamination exists due to the nature of the business, industry, or operation. There are a number of methods that water systems can use to work cooperatively with potential sources of contamination, including educational visits and inspections of stored materials. Many owners of such facilities may not even be aware that they are located near a public water supply well.

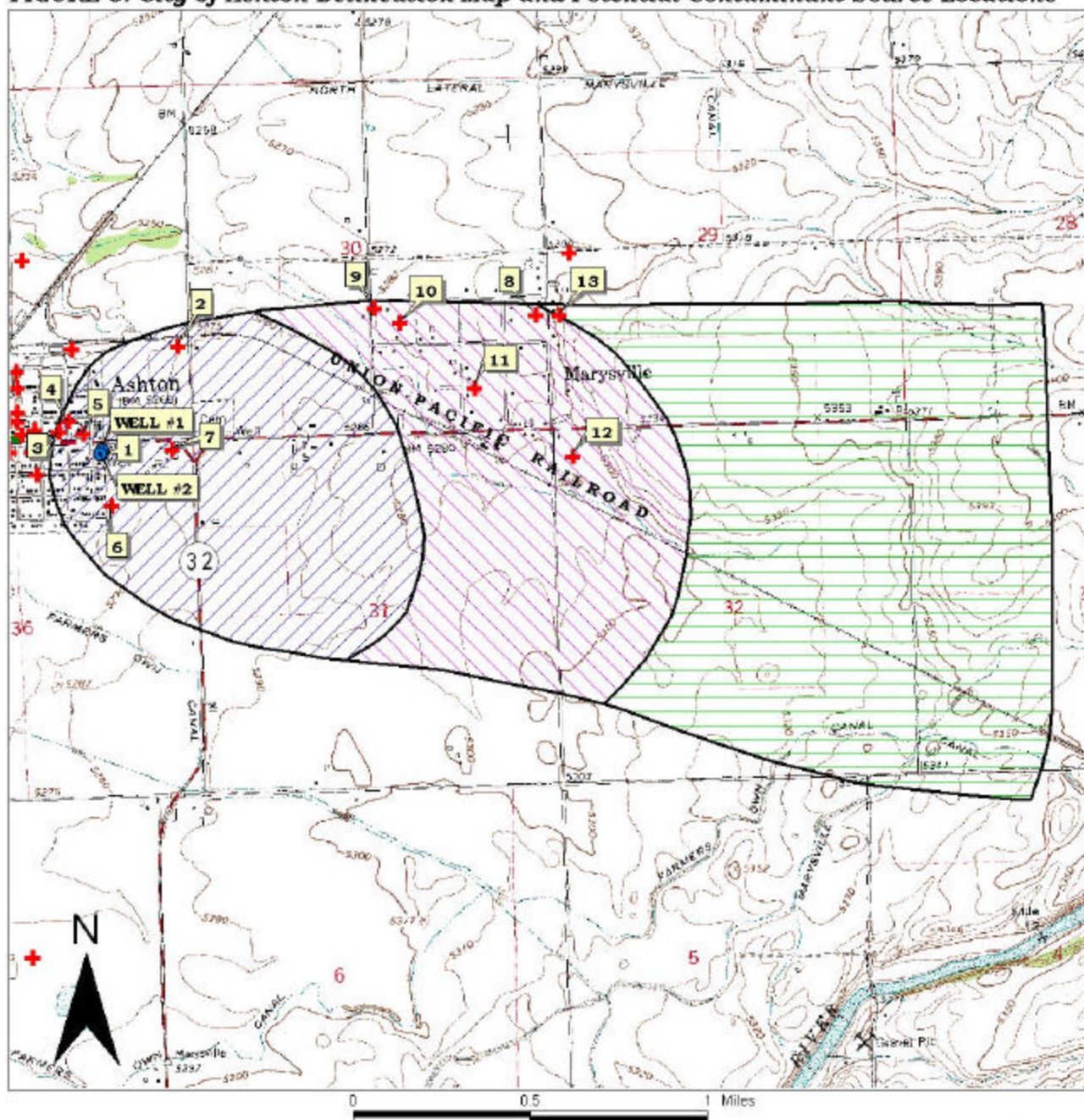
## **Contaminant Source Inventory Process**

A two-phased contaminant inventory of the study area was conducted in the summer of 1998 and then in December 2000. The December 2000 phase involved identifying and documenting potential contaminant sources within the City of Ashton Source Water Assessment Area (Figure 3) through the use of computer databases and Geographic Information System maps developed by DEQ. The enhanced phase was conducted prior to the Source Water Assessment process as part of an as yet unpublished DEQ report. This enhanced phase of the contaminant inventory involved contacting the operator to identify and add any additional potential sources in the area.

The delineated source water area encompasses the eastern side of Ashton, the Marysville area, and the surrounding agricultural land. The 13 potential contaminant sites and two major transportation corridors are listed in Table 1. The sources include a Group 1 Priority site for nitrates, a transformer location, a nursing home, an electrical contractor, a community center, pasture land, two feedlots, a pig lot, a construction maintenance shop, two sawmill facilities, and an equipment storage facility. Additionally, State Highway 32 and the railroad provide major transportation corridors that have the potential of spilling IOCs, VOCs, SOCs, and microbial contaminants. Figure 3 shows the locations of these various potential contaminant sites relative to the wellheads.



**FIGURE 3. City of Ashton Delineation Map and Potential Contaminant Source Locations**



**PWS# 7220004**  
**WELL #1 & #2**



**Table 1. City of Ashton Wells, Potential Contaminant Inventory**

SITE #	Source Description	TOT Zone <sup>1</sup> (years)	Source of Information	Potential Contaminants <sup>2</sup>
1	Group 1 Nitrate Area	0-3	Database Search	IOC
2	Transformers	0-3	Enhanced Inventory	IOC, VOC, SOC
3	Nursing Home	0-3	Enhanced Inventory	IOC, VOC, SOC, Microbial
4	Electrical Contractor	0-3	Enhanced Inventory	IOC, VOC, SOC
5	Community Center	0-3	Enhanced Inventory	IOC, VOC, SOC
6	Grazing Pasture	0-3	Enhanced Inventory	IOC, SOC, Microbial
7	Feedlot	0-3	Enhanced Inventory	IOC, SOC, Microbial
8	Pig Lot	3-6	Enhanced Inventory	IOC, SOC, Microbial
9	Construction Maintenance Shop	3-6	Enhanced Inventory	IOC, VOC, SOC
10	Sawmill/Pole Production	3-6	Enhanced Inventory	IOC, VOC, SOC
11	Equipment Storage	3-6	Enhanced Inventory	IOC, VOC, SOC
12	Sawmill/Post Treatment Facility	3-6	Enhanced Inventory	IOC, VOC, SOC
13	Feedlot	6-10	Enhanced Inventory	IOC, SOC
	State Highway 34	0-3	Database Search	IOC, VOC, SOC, Microbial
	Railroad	0-10	Database Search	IOC, VOC, SOC, Microbial

<sup>1</sup> TOT = time-of-travel (in years) for a potential contaminant to reach the wellhead

<sup>2</sup> IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

### Section 3. Susceptibility Analyses

The water system's susceptibility to contamination was ranked as high, moderate, or low risk according to the following considerations: hydrologic characteristics, physical integrity of the well, land use characteristics, and potentially significant contaminant sources. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each well is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. The following summaries describe the rationale for the susceptibility ranking.

#### Hydrologic Sensitivity

Hydrologic sensitivity was high for both wells (Table 2). This reflects the nature of the soils being in the moderately-drained to well-drained class, the vadose zone (zone from land surface to the water table) being made predominantly of fractured rock, and the first ground water being located within 30 feet of the ground surface. Additionally, the wells do not have a laterally extensive low permeability unit that could retard the downward movement of contaminants.

The delineated area soils are classified as being very deep, nearly level to moderately steep, well-drained soils formed from wind blown material. Such soils allow for much drainage from surface applied contaminants to the underlying ground water system. The ground water fluctuates to within 10 feet of the surface during periods of high water and there are no confining layers to prevent the easy movement of contaminants to the underlying ground water.

## **Well Construction**

Well construction directly affects the ability of the well to protect the aquifer from contaminants. The City of Ashton drinking water system consists of two wells that extract groundwater for domestic, industrial, recreational, and commercial uses. The well system construction scores were high for both wells. The well construction scores are based on the most recent sanitary survey and well logs from the surrounding area.

A sanitary survey conducted on the City of Ashton wells in December 1994 determined if the wells were in compliance drinking water standards. Both wells have well buildings with concrete floor slabs. The sanitary survey stated that both wells needed to have down facing, screened casing vents terminating at least 18 inches above the floor. Well logs were available, so a determination could be made as to whether the casing and annular seals extended into low permeability units and whether current public water system (PWS) construction standards were being met.

The Well #1 log shows that it was drilled in 1923 to a depth of 105 feet below ground surface (bgs). The log has incomplete data regarding the screened intervals on the 6-inch diameter well casing. The water table was identified at 45 feet bgs.

The Well #2 log, dated 1959, shows that the original well was drilled in 1948. The log does not show whether the annular seal extends into a low permeability unit. The well has 14-inch diameter steel casing from ground surface to the depth of 59 feet bgs and 12-inch diameter steel casing to 320 feet bgs. The water table was identified at 30 feet bgs.

Though the wells may have been in compliance with standards when they were completed, current PWS well construction standards are more stringent. The Idaho Department of Water Resources Well Construction Standards Rules (1993) require all PWSs to follow DEQ standards as well. IDAPA 58.01.08.550 requires that PWSs follow the Recommended Standards for Water Works (1997) during construction. Table 1 of the Recommended Standards for Water Works (1997) lists the required steel casing thickness for various diameter wells. Six-inch diameter wells require a casing thickness of at least 0.288-inches, and no information was available as to the thickness of the steel casing used.

## **Potential Contaminant Source and Land Use**

The wells rated high for IOCs (i.e. nitrates, arsenic), SOC's (i.e. pesticides), and VOC's (i.e. petroleum products), and moderate for microbial contaminants (i.e. bacteria). Commercial and industrial land uses in the delineated source areas accounted for the largest contribution of VOC and SOC points to the potential contaminant inventory rating. Agricultural and residential land uses accounted for the most points in the IOC potential contaminant inventory rating. Microbial contaminants may be contributed from the agricultural feedlots and the major transportation corridors.

The significant water chemistry problem that has been recorded in the finished well water is the IOC nitrate. Both wells have consistently approached or exceeded the MCL of 10 mg/L in the summer months. Total coliform bacteria and *E-coli* bacteria have been detected in the distribution system, but repeat samples have never found bacteria present at the wellheads. No VOC's or SOC's have been detected in the well water.

## Final Susceptibility Ranking

A detection above a drinking water standard MCL or a detection of total coliform bacteria or fecal coliform bacteria at the wellhead will automatically give a high susceptibility rating to a well despite the land use of the area because a pathway for contamination already exists. In this case, both wells automatically rate in the high category due to the nitrate MCL violations. Hydrologic sensitivity and system construction scores are heavily weighted in the final scores. Having multiple potential contaminant sources in the 0 to 3-year time of travel zone (Zone 1B) and agricultural land contribute greatly to the overall ranking. In terms of total susceptibility, the wells rate high for all categories.

**Table 2. Summary of City of Ashton Susceptibility Evaluation**

Susceptibility Scores <sup>1</sup>										
Well	Hydrologic Sensitivity	Contaminant Inventory				System Construction	Final Susceptibility Ranking			
		IOC	VOC	SOC	Microbials		IOC	VOC	SOC	Microbials
	Well #1	H	H	H	H	M	H	H* <sup>2</sup>	H	H
Well #2	H	H	H	H	M	H	H*	H	H	H

<sup>1</sup>H = High Susceptibility, M = Moderate Susceptibility, L = Low Susceptibility,

IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

<sup>2</sup>H\* = Well rated automatically high due to an IOC Maximum Contaminant Level exceedance in the tested drinking water.

## Susceptibility Summary

Overall, the wells rank as high susceptibility for all contaminant categories. The well-drained nature of the soils, the intense agricultural practices, and local business potential contaminant sources add to the high susceptibility ratings. A lack of information about the construction of the well also increased the rating.

The significant water chemistry problem that has been recorded in the finished well water is the IOC nitrate. Both wells have consistently approached or exceeded the MCL of 10 mg/L in the summer months. Total coliform bacteria and *E-coli* bacteria have been detected in the distribution system, but repeat samples have never been found at the wellheads. No VOCs or SOC's have been detected in the well water.

## Section 4. Options for Source Water Protection

The susceptibility assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what the susceptibility ranking a source receives, protection is always important. Whether the source is currently located in a “pristine” area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

An effective source water protection program is tailored to the particular local source water protection area. A community with a fully developed source water protection program will incorporate many strategies. For the City of Ashton, source water protection activities should focus on implementation of practices aimed at reducing the leaching of agricultural chemicals from agricultural land within the designated source water areas. The proposed practices outlined in the *City of Ashton Water Supply System Nitrate Mitigation Study* (Jorgensen Engineering, 2000) should be evaluated for implementation. Regulatory discrepancies outlined in the 1994 Sanitary Survey should be addressed if they have not been corrected. Much of the designated protection areas are outside the direct jurisdiction of the City of Ashton. Partnerships with state and local agencies and industry groups should be established and are critical to the success of source water protection. All wells should maintain sanitary survey standards regarding wellhead protection. Disinfection practices should be implemented if microbial contamination becomes a problem. A reverse osmosis system could be added to reduce the levels of nitrates delivered to customers. Additional management strategies for dealing with nitrate contamination are summarized in *Nitrates in Ground Water: A Continuing Issue for Idaho Citizens* (DEQ, 2001).

Continued vigilance in keeping the well protected from surface flooding can also keep the potential for contamination reduced. Due to the time involved with the movement of groundwater, wellhead protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. Source water protection activities for agriculture should be coordinated with the Idaho Department of Agriculture, the Soil Conservation Commission, the local Soil and Water Conservation District, and the Natural Resources Conservation Service.

## **Assistance**

Public water supplies and others may call the following DEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the DEQ office for preliminary review and comments.

Idaho Falls Regional DEQ Office      (208) 528-2650

State DEQ Office      (208) 373-0502

Website: <http://www2.state.id.us/deq>

Water suppliers serving fewer than 10,000 persons may contact John Bokor, Idaho Rural Water Association, at 1-800-962-3257 for assistance with wellhead protection strategies.



## POTENTIAL CONTAMINANT INVENTORY

### LIST OF ACRONYMS AND DEFINITIONS

**AST (Aboveground Storage Tanks)** – Sites with aboveground storage tanks.

**Business Mailing List** – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

**CERCLIS** – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as ASuperfund, is designed to clean up hazardous waste sites that are on the national priority list (NPL).

**Cyanide Site** – DEQ permitted and known historical sites/facilities using cyanide.

**Dairy** – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

**Deep Injection Well** – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

**Enhanced Inventory** – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (DEQ) during the primary contaminant inventory.

**Floodplain** – This is a coverage of the 100-year floodplains.

**Group 1 Sites** – These are sites that show elevated levels of contaminants and are not within the priority one areas.

**Inorganic Priority Area** – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

**Landfill** – Areas of open and closed municipal and non-municipal landfills.

**LUST (Leaking Underground Storage Tank)** – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

**Mines and Quarries** – Mines and quarries permitted through the Idaho Department of Lands.)

**Nitrate Priority Area** – Area where greater than 25% of wells/springs show nitrate values above 5mg/l.

**NPDES (National Pollutant Discharge Elimination System)** – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

**Organic Priority Areas** – These are any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards.

**Recharge Point** – This includes active, proposed, and possible recharge sites on the Snake River Plain.

**RICRIS** – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

**SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities)** – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

**Toxic Release Inventory (TRI)** – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

**UST (Underground Storage Tank)** – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

**Wastewater Land Applications Sites** – These are areas where the land application of municipal or industrial wastewater is permitted by DEQ.

**Wellheads** – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

**NOTE:** Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

Where possible, a list of potential contaminant sites unable to be located with geocoding will be provided to water systems to determine if the potential contaminant sources are located within the source water assessment area.

## References Cited

- Crosthwaite, E.G., et al., 1970. *Groundwater Aspects of the Lower Henrys Fork Region, Eastern Idaho*. U.S. Geological Survey, Water Supply Paper 1879-C.
- Gilli, G., G. Corrao, S. Favilli, 1984. *Concentrations of nitrates in drinking water and incidence of gastric carcinomas: first descriptive study of the Piemonte region, Italy*. Sci Tot Environ 34:35-48.
- Great Lakes-Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers, 1997. "Recommended Standards for Water Works."
- Idaho Department of Environmental Quality, 1997. *Design Standards for Public Drinking Water Systems*. IDAPA 58.01.08.550.01.
- Idaho Department of Environmental Quality, 2001. *Nitrates in Ground Water: A Continuing Issue for Idaho Citizens*. Ground Water Quality Information Series. No.1. 21 pages.
- Idaho Department of Water Resources, 1993. *Administrative Rules of the Idaho Water Resource Board: Well Construction Standards Rules*. IDAPA 37.03.09.
- Jorgensen Engineering and Land Surveying P.C., 2000. *City of Ashton: Water Supply System Nitrate Mitigation Study*. Project Funded in part by Idaho Department of Water Resources.
- Rademach J.J., T.B. Young, M.S. Kanarek, 1992. *Gastric cancer mortality and nitrate levels in Wisconsin drinking water*. Arch Environ Health 47:292-4.
- Schubert, C., L. Knobeloch, H. Anderson, C. Warzecha, and M. Kanarek, 1997. *Nitrate Contaminated Drinking Water Followback Study*, Submitted to the Wisconsin Dept. of Natural Resources and the Wisconsin Ground Water Coordinating Council. Department of Preventive Medicine, University of Wisconsin-Madison and the Wisconsin Department of Health and Family Services. 17 pages.
- Scragg, R.K.R., M.M. Dorsch, A.J. McMichael, P.A. Baghurst, 1982. *Birth defects and household water supply*. Med J Aust 2:577-9.
- USEPA, 1990a. *Estimated national occurrence and exposure to nitrate/nitrite in public drinking water supplies*. Prepared by Wade Miller Associates, Inc. under EPA contract nr. 68-03-3514.
- Whitehead, R.L., 1978. *Water Resources of the Upper Henrys Fork Basin in Eastern Idaho*. Idaho Department of Water Resources. Water Information Bulletin No. 46.
- Whitehead, R.L., 1992. *Geohydrologic Framework of the Snake River Plain Regional Aquifer System, Idaho and Eastern Oregon*. U.S. Geological Survey, Professional Paper 1408-B.

## Attachment A

### City of Ashton Susceptibility Analysis Worksheets

The final scores for the susceptibility analysis were determined using the following formulas:

- 1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.2)
- 2) 2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.35)

Final Susceptibility Scoring:

- 0 - 5 Low Susceptibility
- 6 - 12 Moderate Susceptibility
- $\geq 13$  High Susceptibility

## 1. System Construction

## SCORE

Drill Date	08/01/1923	
Driller Log Available	YES	
Sanitary Survey (if yes, indicate date of last survey)	YES	1994
Well meets IDWR construction standards	NO	1
Wellhead and surface seal maintained	NO	1
Casing and annular seal extend to low permeability unit	NO	2
Highest production 100 feet below static water level	NO	1
Well located outside the 100 year flood plain	YES	0

Total System Construction Score 5

## 2. Hydrologic Sensitivity

Soils are poorly to moderately drained	NO	2
Vadose zone composed of gravel, fractured rock or unknown	YES	1
Depth to first water > 300 feet	NO	1
Aquitard present with > 50 feet cumulative thickness	NO	2

Total Hydrologic Score 6

## 3. Potential Contaminant / Land Use - ZONE 1A

IOC Score	VOC Score	SOC Score	Microbial Score
--------------	--------------	--------------	--------------------

Land Use Zone 1A	IRRIGATED CROPLAND	2	2	2	2
Farm chemical use high	YES	2	0	2	
IOC, VOC, SOC, or Microbial sources in Zone 1A	YES	YES	NO	NO	NO
Total Potential Contaminant Source/Land Use Score - Zone 1A		4	2	4	2

## Potential Contaminant / Land Use - ZONE 1B

Contaminant sources present (Number of Sources)	YES	9	6	8	5
(Score = # Sources X 2 ) 8 Points Maximum		8	8	8	8
Sources of Class II or III leacheable contaminants or	YES	8	3	3	
4 Points Maximum		4	3	3	
Zone 1B contains or intercepts a Group 1 Area	YES	2	0	0	0
Land use Zone 1B Greater Than 50% Irrigated Agricultural Land		4	4	4	4

Total Potential Contaminant Source / Land Use Score - Zone 1B 18 15 15 12

## Potential Contaminant / Land Use - ZONE II

Contaminant Sources Present	YES	2	2	2	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Land Use Zone II Greater Than 50% Irrigated Agricultural Land		2	2	2	

Potential Contaminant Source / Land Use Score - Zone II 5 5 5 0

## Potential Contaminant / Land Use - ZONE III

Contaminant Source Present	YES	1	1	1	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Is there irrigated agricultural lands that occupy > 50% of	YES	1	1	1	

Total Potential Contaminant Source / Land Use Score - Zone III 3 3 3 0



Cumulative Potential Contaminant / Land Use Score	30	25	27	14
4. Final Susceptibility Source Score	17	16	16	16
5. Final Well Ranking	High	High	High	High

## 1. System Construction

## SCORE

Drill Date	04/01/1948	
Driller Log Available	YES	
Sanitary Survey (if yes, indicate date of last survey)	YES	1994
Well meets IDWR construction standards	NO	1
Wellhead and surface seal maintained	NO	1
Casing and annular seal extend to low permeability unit	NO	2
Highest production 100 feet below static water level	NO	1
Well located outside the 100 year flood plain	YES	0

Total System Construction Score 5

## 2. Hydrologic Sensitivity

Soils are poorly to moderately drained	NO	2
Vadose zone composed of gravel, fractured rock or unknown	YES	1
Depth to first water > 300 feet	NO	1
Aquitard present with > 50 feet cumulative thickness	NO	2

Total Hydrologic Score 6

## 3. Potential Contaminant / Land Use - ZONE 1A

IOC Score	VOC Score	SOC Score	Microbial Score
--------------	--------------	--------------	--------------------

Land Use Zone 1A	IRRIGATED CROPLAND	2	2	2	2
Farm chemical use high	YES	2	0	2	
IOC, VOC, SOC, or Microbial sources in Zone 1A	YES	YES	NO	NO	NO
Total Potential Contaminant Source/Land Use Score - Zone 1A		4	2	4	2

## Potential Contaminant / Land Use - ZONE 1B

Contaminant sources present (Number of Sources)	YES	9	6	8	5
(Score = # Sources X 2 ) 8 Points Maximum		8	8	8	8
Sources of Class II or III leacheable contaminants or	YES	8	3	3	
4 Points Maximum		4	3	3	
Zone 1B contains or intercepts a Group 1 Area	YES	2	0	0	0
Land use Zone 1B Greater Than 50% Irrigated Agricultural Land		4	4	4	4

Total Potential Contaminant Source / Land Use Score - Zone 1B 18 15 15 12

## Potential Contaminant / Land Use - ZONE II

Contaminant Sources Present	YES	2	2	2	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Land Use Zone II Greater Than 50% Irrigated Agricultural Land		2	2	2	

Potential Contaminant Source / Land Use Score - Zone II 5 5 5 0

## Potential Contaminant / Land Use - ZONE III

Contaminant Source Present	YES	1	1	1	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Is there irrigated agricultural lands that occupy > 50% of	YES	1	1	1	

Total Potential Contaminant Source / Land Use Score - Zone III 3 3 3 0

Cumulative Potential Contaminant / Land Use Score	30	25	27	14
4. Final Susceptibility Source Score	17	16	16	16
5. Final Well Ranking	High	High	High	High